



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

[NOTICE: (23-032)]

AGENCY: National Aeronautics and Space Administration (NASA)

ACTION: Lunabotics Challenge.

SUMMARY: The Lunabotics Challenge (one of NASA's Artemis Student Challenges, <https://stem.nasa.gov/artemis/>) has provided college students from around the country an opportunity to engage and learn the NASA Systems Engineering process by designing and building robotic Lunar excavators capable of mining regolith and icy regolith simulants.

DATES: Challenge registration opened on September 14, 2022 and closed on October 19, 2022. No further requests for registration will be accepted after the stated deadline.

Other important dates, including deadlines for key deliverables from the Teams, are listed on the Challenge website: <https://www.nasa.gov/offices/education/centers/kennedy/technology/nasarmc.html>

FOR FURTHER INFORMATION CONTACT: To get additional information regarding the Lunabotics Challenge, please contact Rich Johanboeke (321) 867-0586 and visit:

<https://www.nasa.gov/offices/education/centers/kennedy/technology/nasarmc.html>

Questions and comments regarding the challenge should be addressed to: ksc-robotic-mining-competition@mail.nasa.gov

SUPPLEMENTARY INFORMATION:

Summary

The Lunar robot shall drive in a simulated Lunar arena filled with Black Point -1 regolith simulant and excavate the icy-regolith simulant buried under an overburden of granular material, then return to the starting site and deliver the granular material to a simulated receiving hopper. More details are provided in Lunabotics Guidebook. This is a two-semester, virtual challenge, designed to educate college students in the application of the NASA Systems Engineering process. The virtual events of the Challenge are as follows:

1. Project Management Plan, 2. Systems Engineering Paper, 3. Public Outreach Report, 4. Presentation and Demonstration (optional), and a 5. Proof of Life Video. NASA is providing the prize purse.

For more than a decade, NASA has been able to gather valuable data about necessary excavation hardware and surface locomotion processes that can be implemented as the agency prepares to return to the Moon through the Artemis program. Major gaps exist between the functional capabilities and the technologies necessary for Lunar surface construction, and the requirements needed to narrow these gaps are in development and will support the long-term presence on the Moon, also known as “Infrastructure to Stay”. Once identified, NASA will seek input from American academia to find new and innovative ways to apply existing or develop new technologies to meet Artemis Program requirements.

The skills developed in Lunabotics apply to other high technology industries that rely on the systems engineering principles. These industries will create a workforce posed to lead a new space-based economy and add to the economic strength of our country. NASA directly benefits from this challenge by annually assessing student designs and data the same way it does for its own, less frequent, prototypes. Encouraging innovation in student designs increases the potential of identifying clever solutions to the many challenges inherent in future Artemis missions.

ACCREDITATION BOARD FOR ENGINEERING AND TECHNOLOGY (ABET) - One of the goals of Lunabotics is to introduce students to the ABET experience by aligning the events to those student outcomes. ABET is a nonprofit, ISO 9001 certified organization that accredits college and university programs in applied and natural science, computing, engineering, and engineering technology. ABET accredits college and university programs in the disciplines of applied and natural science, computing, engineering, and engineering technology at the associate, bachelor’s, and master’s degree levels. ABET is the basis of quality for STEM disciplines all over the world. Schools do not have to be ABET accredited to participate.

STEM ENGAGEMENT

NASA's journeys have propelled technological breakthroughs, pushed the frontiers of scientific research, and expanded our understanding of the universe. These accomplishments, and those to come, share a common genesis: education in science, technology, engineering, and math. In NASA STEM Engagement, we deliver tools for students and educators to learn and succeed. We seek to: Create unique opportunities for a diverse set of students to contribute to NASA's work in exploration and discovery; Build a diverse future STEM workforce by engaging students in authentic learning experiences with NASA's people, content, and facilities, and attract diverse groups of students to STEM through learning opportunities that spark interest and provide connections to NASA's mission and work. NASA STEM Engagement strives to increase K-12 involvement in NASA projects, enhance higher education, support underrepresented communities, strengthen online education, and boost NASA's contribution to informal education. The intended outcome is a generation

I. Prize Amounts

Lunabotics has a total prize purse of \$28,000.00 USD, (twenty-eight thousand United States dollars).

There are three categories for awards in which teams can place 1st, 2nd or 3rd Place. Teams must meet the eligibility requirements to receive a prize from NASA.

II. Eligibility to Participate and Win Prize Money

To be eligible to win a prize, competitors must register and comply with all requirements in the Lunabotics guidebook. Interested Teams should refer to the official Lunabotics website

(<https://www.nasa.gov/offices/education/centers/kennedy/technology/nasarmc.html>) for full details on eligibility and registration.

III. Official Rules

The complete official rules for the Lunabotics can be found at:

<https://www.nasa.gov/offices/education/centers/kennedy/technology/nasarmc.html>

Cheryl Parker,
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